DOCUMENT RESUME

ED 416 216 TM 028 068

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TITLE Measuring the Jungian Personality Types of High School Students.

PUB DATE 1998-01-24

NOTE 27p.; Paper presented at the Annual Meeting of the Southwest Educational Research Association (Houston, TX, January, 24 1998).

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Counseling; Factor Analysis; *High School Students; High Schools; *Hispanic Americans; Personality Assessment; *Personality Traits; Psychometrics; Test Reliability; *Test Use

IDENTIFIERS *Hispanic American Students; Jung (Carl G); *Personal Preferences Self Description Quest; Preservice Teachers

ABSTRACT

Measures of normal variations in personality, called "psychological type," are frequently used in education (e.g., to identify learning styles) and counseling (e.g., in career counseling). However, the most frequently used measure of types has been criticized on various psychometric grounds. The present study investigated the psychometric properties of an alternative measure, the Personal Preferences Self-Description Questionnaire (PPSDQ). The study was conducted with 328 Hispanic high school students, partly to determine whether the sound psychometric quality of PPSDQ scores was compromised on this sample by vocabulary or language issues. The results of reliability and factor analyses were generally favorable with regard to PPSDQ score integrity. The PPSDQ may have some utility in evaluating Jungian psychological types even with Hispanic American high school students. Appendixes present reliability analyses for the students and for 49 preservice teachers and a correlation matrix for item packets. (Contains 3 tables and 31 references.) (Author/SLD)

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Measuring the Jungian Personality Types of High School Students

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Paper presented at the annual meeting of the Southwest Educational Research Association, Houston, TX, January 24, 1998. The author appreciates the helpful comments of Bruce Thompson on a previous version of this paper, and for his permission to use the Personal Preferences Self-Description Questionnaire (PPSDQ) in the present study.

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Abstract

Measures of normal variations in personality, called "psychological type," are frequently used in education (e.g., to identify learning styles) and counseling (e.g., in career counseling). However, the most frequently-used measure of types has been criticized on various psychometric grounds. The present study investigated the psychometric properties of an alternative measure, the Personal Preferences Self-Description Questionnaire. The study was conducted with 328 Hispanic high school students, partly to determine whether the sound psychometric quality of PPSDQ scores was compromised in this sample by vocabulary or language issues. The results of reliability and factor analyses were generally favorable as regards PPSDQ score integrity.

Carl Jung developed his typology of personalities over a 20 year period. His book, Psychological Types, was published in 1923 and dealt with psychic energy and one's orientation in the world. Jung differentiated eight typological groups: two personality attitudes, Extraversion and Introversion, and four functions or modes of orientation, which were Sensing, iNtuition, Thinking, and Feeling. This view can be represented as a four-by-two matrix:

	Extraversion	Introversion
Sensing	ES	IS
iNtuition	EN	IN
Thinking	ET	IT
Feeling	EF	IF

The Introverted personality has interests that are directed toward the inner reality and, as Jung wrote, "is normally characterized by a hesitant, reflective, retiring nature that keeps itself to itself, shrinks from objects [and] is always slightly on the defensive" (Read, Fordham, Adler, & McGuire, 1953-1979, vol. 7, par. 62). The Extraverted personality has interests that are directed toward the outer reality and according to Jung "is normally characterized by an outgoing, candid and accommodating nature that adapts easily to a given situation, quickly forms attachments, and, setting aside any possible misgivings, will often venture forth with careless confidence into unknown situation" (Read et al., 1953-1979, vol. 7, par 62).

The four functions or modes of orientation are divided into two groups: rational (Judging) and irrational (Perceiving).

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Thinking, referring to cognitive thought, and Feeling, referring to subjective judgment or valuation, are the two rational functions, while Sensing, referring to the physical sense organs, and iNtuition, referring to unconscious perception, are the two irrational functions. As Sharp (1987, p. 14) explained, "the sensation [S] function establishes that something exists, thinking [T] tells us what it is, feeling [F] tells us what it's worth, and through intuition [N] we have a sense of what can be done with it." According to Jung, each person usually uses all four functions but has a preference for one function, which is called the "dominant" or "superior" function. In Jung's view, no person is a pure representation of one of the eight types portrayed above.

In 1973, what was to become an extremely popular measure (Myers & McCaulley, 1985) of Jungian types was first published by Katharine Briggs and her daughter, Isabel Myers. Myers is given most of the credit for the current version of the theory (Bayne, 1995). Neither Myers nor Briggs were psychologists or statisticians. They were interested in dominant function and preferences, but computers were not readily available at that time for item analysis to guide their item formulation and revision. They would test an item on people they knew well and who displayed consistent thinking or feeling behavior. Bayne (1995) explained how the item selection worked. If an item was answered in a thinking direction by the thinking group 60% or more of the time and in a feeling direction less than 50% of the time by the feeling group, the item was retained. Moreover, the item had to not

measure the other preferences and to work on people they did not know and who did not have such clear preferences.

Myers classified 16 "kinds of people" in terms of strengths on four pairs of preferences: (a) Extraversion vs. Introversion, (b) Sensing vs. iNtuition, (c) Thinking vs. Feeling, and (d) Judging vs. Perceiving. Thus, results on this measure are presented as "types," created by identifying a person's preferences within each of the four dimensions (e.g., INTJ, ESTJ).

Jackson, Parker and Dipboye (1996) noted that "the MBTI is *the most widely used* personality instrument, with between 1.5 and 2 million persons completing it each year" (p. 99, emphasis added). More than 3 million copies of this measure were sold in 1993. As Yabroff (1990) noted, the measure "brought Jung's typology to a high level of practical application" (p. 6). Personality type indicators are used in counseling, team building, matching teaching and learning styles, and in career planning.

Measures of the types are popular in education and counseling, in part, because they measure normal variations in personality, and by definition most people are characterized by this sort of personality function. In short, measures of psychological types are among the most frequently used measures of personality (Thompson & Ackerman, 1994).

However, notwithstanding its popularity, the Myers and Briggs' measure has certainly provoked considerable psychometric controversy. Paired articles debating related measurement issues have appeared, for example, in an issue of the Journal of

Counseling and Development (Carlson, 1989; Healy, 1989) and also in an issue of Measurement and Evaluation in Counseling and Development (McCaulley, 1991; Merenda, 1991).

The measure has been criticized for the use of a forced-choice response format, which yields spurious negative correlations among items (Kerlinger, 1986, p. 463). And the measure has been criticized for yielding dichotomized types rather than continuous scores, and for not acknowledging that some people may have relatively neutral preferences on some dimensions.

An alternative measure of type has been developed by Thompson--the Personal Preferences Self-Description Questionnaire (PPSDQ) (cf. Kier, Melancon & Thompson, in press). The PPSDQ has undergone an iterative series of revisions across a series of samples (cf. Arnau, Thompson, & Rosen, 1997; Kier & Thompson, 1997; Melancon & Thompson, 1994, 1996; Thompson & Melancon, 1995, 1996a, 1996b, 1997; Thompson & Stone, 1994). The PPSDQ has been designed to avoid some of the problems that have been ascribed to the Myers and Briggs' measure.

The purpose of the present study was to explore the reliability and validity of PPSDQ scores when the measure is completed by Hispanic high school students. The psychometric properties of PPSDQ scores have not previously been investigated with either high school students or an exclusively minority sample of participants. The study investigated whether the PPSDQ involves vocabulary too sophisticated for some high students, and especially for high school students for whom English may not be their primary

language. Thus, the present study constituted a rigorous test of the psychometric properties of PPSDQ scores.

Method

Sample

The primary sample in the present study consisted of 328 high school students enrolled in senior-level courses. All of the students were Hispanic. There were somewhat more males (n=181, 55.2%) than females in the sample. The students' mean age was 17.3 (SD=.62) years.

To provide a more rigorous test of the use of the PPSDQ's vocabulary with high school students, the sample was not limited to regular education students. Some of the participants were receiving (n=11) or had previously received (n=9) non-gifted special education services. Forty-seven of the students were currently receiving intervention for the gifted.

Furthermore, most of the students (n=225, 68.6%) spoke both Spanish and English. Eighty-six (26.2%) reported that Spanish was the primary language spoken at home.

For comparison purposes, a small sample of pre-service teachers (n=49) also completed the study's measures. Results from previous studies (i.e., Kier et al., in press) were also used to augment the interpretation of the results for the high school Hispanic participants.

Instrumentation

As noted previously, the participants completed the PPSDQ. The PPSDQ consists of 93 items involving either semantic-differential

scales or sentences. In previous work it was found that word-pair items tend to perform well in measuring the first three constructs (EI, SN, TF), but that at least some items in sentence form appear necessary to measure the more complex Judging-Perceiving dimension (Melancon & Thompson, 1996; Thompson & Melancon, 1996a, 1996b). However, all four scales are measured by items of both types.

Some of the PPSDQ items on each scale are phrased in opposite directions so as to minimize response set influences. The PPSDQ word-pair items are presented as semantic differential scales with a "1" to "7" response format. The response format for the sentence items involves Likert-type scales indicating strongest disagreement ("1") to strongest agreement ("7").

The participants also completed a short form (Reynolds, 1982) of the Marlowe-Crowne social desirability scale, so that divergent validity of PPSDQ scores could also be evaluated in this sample. The items from the 2 measures were randomly collated into a single measure in the present study.

Results

Table 1 presents the alpha coefficients for scores on the four PPSDQ scales. The table presents these results for the Hispanic high school students, for the pre-service teachers, and for both samples combined. For additional comparative purposes, the related results for 641 college students reported by Kier et al. (in press) are also presented.

INSERT TABLE 1 ABOUT HERE.

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Scores on PPSDQ items (ranging from "1" to "7") were correlated with the Marlowe-Crowne social desirability response set scores in order to evaluate PPSDQ score divergent validity. The mean r^2 values across the four PPSDQ scales were: EI, 0.7% (SD=0.9%); SN, 1.1% (SD=1.4%); TF, 0.9% (SD=1.0%), and JP, 1.0% (SD=1.1%).

Finally, a confirmatory factor analysis was employed to evaluate the PPSDQ data. Item "packets" (which some researchers also call "testlets" or item "parcels"; see Cattell, 1956; Cattell & Burdsal, 1975; Gorsuch, 1983, pp. 294-295) were created to yield more reliable scores to analyze, since scores on individual items tend to be highly unreliable. Item packets were also used to bring the ratio of the sample size (i.e., 328) to the number of measured variables (i.e., 12 packets) more in line with suggested practice (here 328:12 = 27.3:1).

The 12 PPSDQ packets were computed by adding the scores on a subset of items, after reverse-scoring for items scaled in opposite directions. The three packets per PPSDQ scale consisted of from seven to nine items (i.e., EI, 21 items, packets of 7, 7, and 7 items; SN, 23 items, packets of 8, 8, and 7 items; TF, 24 items, packets of 8, 8, and 8 items; JP, 25 items, packets of 9, 8, and 8 items).

Traditionally, plausible rival models are tested in confirmatory factor analyses. Here, two models were tested. The first model presumed that three packets measured each of the four factors (i.e., EI, SN, TF, and JP), and that the factors were

uncorrelated. Based on the scale correlations reported by Kier et al. (in press) in a previous study with an independent sample (r_{TFxEI} = -.313 and r_{JPxSN} = .571), in the second model these two pairs factors and only these were freed to be correlated in the model.

Table 2 presents various model fit statistics for the two models. The tabled results suggest that the second model provide a better fit to the data. The chi-square for this model was 140.37 (df=52). The ratio of noncentrality to degrees of freedom was 1.70 ([140.37 - 52) / 52). The goodness of fit statistic was .933. The comparative fit index was .927. The root mean square error of approximation was .005. Table 3 presents the maximum-likelihood factor parameters for a model presuming that four factors (Byrne, 1989) underlay the data for the 328 Hispanic high school students, with the two pairs of factors allowed to be correlated.

INSERT TABLES 2 AND 3 ABOUT HERE.

Discussion

Prior to presenting an interpretation of the present results, it is important to note that psychometric properties inure to scores, and not to tests (cf. Thompson, 1994). That is, reliability and validity of scores varies somewhat, for example, across samples (i.e., the people themselves affect the reliability of scores). Thus, Vacha-Haase (1998) has proposed a method for exploring the variations in score reliability, once sufficient studies have been conducted to characterize score reliability of a

given measure under various circumstances. The present study adds one such report to the literature regarding scores on the PPSDQ.

The Table 1 results are generally favorable as regards the reliability of PPSDQ scale scores. For the 328 Hispanic high students, even including 20 students who were or had previously received non-gifted special education services, and 86 students who reported that Spanish was the primary language spoken at home, the vocabulary of the PPSDQ was still sufficiently accessible to permit estimation of reasonably reliable scores.

As regards divergent validity of scores on the PPSDQ items, the mean r^2 values between PPSDQ item scores and Marlowe-Crowne social desirability scores were very small. The mean r^2 values on the four PPSDQ scales ranged from 0.7% (EI) to 1.1% (SN).

Factor analysis has long been used as part of the effort to evaluate score construct validity, as explained by Thompson and Daniel (1996) in their review of these applications. The results here of the confirmatory factor analysis also tended to be positive. The fit statistics previously enumerated are within generally accepted bounds (Byrne, 1989). As reported in Table 3, all the factor pattern coefficients are several times their standard errors, as expected. Furthermore, the two estimated factor correlation coefficients are remarkably similar to those reported by Kier et al. (in press) with an independent sample of 641 college students.

Overall, these results suggest that the Personal Preferences Self-Description Questionnaire may have some utility in evaluating

Jungian psychological types even with Hispanic high school students. The PPSDQ may be useful, because the measure avoids some of the previously described pitfalls associated with other measures of type. Of course, no single study ever conclusively resolves issues regarding the psychometric properties of scores from a measure. And, in any case, these properties should be expected to vary somewhat across samples; these variations can even be studied to isolate the measurement features leafing to the greatest variability in score quality (Vacha-Haase, 1998). But the present study represents another important piece of evidence regarding the score quality of a potentially useful measure of normal variations in personality.

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Table 1
Alpha Coefficients Across Several Samples

Sample	Scale			
	EI	SN	TF	JP
High School Hispanics (n=328)	.849	.735	.699	.703
Pre-service Teachers (n=49)	.938	.881	.756	.866
Combined Samples (n=377)	.865	.770	.702	.753
College Students (n=641) (Kier et al., in press)	.904	.867	.879	.892

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Table 2
CFA Model Fit Statistics

	Model	
Statistic	F Uncorr	F Cor 2
v	12	12
n	328	328
Null chi sq	1274.63	1274.63
Null df	66	66
Noncentrality	1208.63	1208.63[a]
Model chi sq	193.90	140.37
Model df	54	52
Noncentrality	139.90	88.37[a]
NC / df	2.59	1.70[b]
GFI	0.909	0.933
Pars Ratio	0.692	0.667[c]
AGFI	0.869	0.899
CFI	0.884	0.927[d]
Pars Ratio	0.818	0.788[c]
RMSR	0.124	0.086
RMSEA	0.008	0.005[f]

Note. Model "F Uncorr" presumed uncorrelated factors, while Model "F Cor 2" allowed only 2 of the 6 factor correlations to be non-zero, as explained in the narrative.

[a]Noncentrality = χ^2 - df

[b]Noncentrality / df

[c]Parsimony Ratio = Model df / [(variables * (variables + 1)) / 2]

[d]$CFI = \frac{[(\text{Null } \chi^2 - \text{Null df}) - (\text{Model } \chi^2 - \text{Model df})]}{(\text{Null } \chi^2 - \text{Null df})}$

[e]Parsimony Ratio = Model df / [(variables * (variables - 1)) / 2]

[f]$RMSEA = [(\text{Model } \chi^2 - \text{Model df}) / (\text{Model df} * (n - 1))]^{.5}$

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Table 3
Maximum-Likelihood Factor Parameter Estimates

Item Packet/ Factor	Factor			
	EI	SN	TF	JP
Factor Matrix				
	EI	SN	TF	JP
EI1	.863(.047)	.000	.000	.000
EI2	.790(.049)	.000	.000	.000
EI3	.839(.048)	.000	.000	.000
SN1	.000	.667(.059)	.000	.000
SN2	.000	.614(.059)	.000	.000
SN3	.000	.774(.060)	.000	.000
TF1	.000	.000	.815(.063)	.000
TF2	.000	.000	.630(.060)	.000
TF3	.000	.000	.599(.060)	.000
JP1	.000	.000	.000	.733(.060)
JP2	.000	.000	.000	.658(.060)
JP3	.000	.000	.000	.649(.060)
Factor Correlation Matrix				
EI	1.000			
SN	.000	1.000		
TF	-.306(.063)	.000	1.000	
JP	.000	.436(.066)	.000	1.000

Note. The standard errors of the parameter estimates are presented in parentheses. Since some packets involved only word-pair items or sentences, or were exclusively positive or negative in their wording, and thus may have been correlated as a measurement artifact, 15 error covariances were freed, subject to the restriction than no covariances within a given set (e.g., EI, SN) of three packets were freed.

APPENDIX A
Reliability Analyses for High School Students (n=328)
and for Pre-service Teachers (n=49)

High School Students (n=328)

EI Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
SOCIPRIV	66.9961	226.4160	.5848	.8355
FRIEDIST	68.1272	237.2706	.4875	.8406
PERSOSHY	66.5430	225.7106	.5978	.8349
APPRMYST	66.8436	234.4677	.4405	.8420
MIXERLON	67.1211	233.8112	.4966	.8398
CONGRECL	66.3951	252.3237	.1882	.8498
EXUBSERE	66.3019	248.3841	.2703	.8478
GREGTIMI	66.2635	245.5565	.2959	.8472
XQUIEEXP	66.8181	225.4742	.6766	.8322
XREFLACT	67.5644	241.9655	.3698	.8447
XINTREXT	66.4816	234.3313	.4857	.8402
XSTILLAN	66.9107	242.3283	.3482	.8455
XSOLIAMI	66.5361	242.1434	.3873	.8442
XSILEGAB	66.2799	226.3843	.6226	.8341
SHYPERSO	66.1115	233.5865	.4003	.8441
PRESWRIT	66.7339	242.7307	.2055	.8544
XGRPPROJ	67.7156	240.2709	.3122	.8476
XRELAXSO	66.9473	235.4329	.4584	.8413
XLIKETAL	66.7644	236.4753	.3421	.8469
XNEWPEOP	68.0064	237.7558	.5191	.8399
XTALKOTH	66.7895	231.5673	.4421	.8421

α = .8491

SN Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
REALINTU	97.3320	141.9032	.1411	.7356
PRECIMAG	96.0865	136.5648	.2514	.7286
CONCEXPL	95.1958	136.4089	.3560	.7214
TRADCREA	95.8045	131.5631	.3461	.7207
DIRINGEN	96.7863	134.5881	.4026	.7179
PLANVISI	96.1734	132.3750	.3611	.7195
PRACTHEO	97.0528	136.1899	.3169	.7235
XINSISYS	96.2782	140.8628	.2024	.7312
XVARIREP	95.6933	137.1787	.3117	.7241
XINVENOR	96.9642	138.4711	.4390	.7122
XINQUCRI	96.4865	140.8511	.1973	.7315
XDIVERCO	96.5809	137.0856	.2628	.7274
XDIVEPRE	97.1519	139.4946	.1939	.7325
XCONCREA	97.7862	139.1778	.2620	.7275
DIFFPERS	95.0148	137.4477	.3145	.7240
USEINTUI	95.5816	141.0213	.2171	.7302
SEEPATTR	95.9243	139.4268	.2596	.7277
NEWSKILL	95.4600	142.0610	.1001	.7403
SEEMEANG	95.6978	138.3164	.2614	.7275
INVENTIV	95.8266	129.5295	.5316	.7073
CREATNEW	95.2591	133.1996	.4101	.7166
XPREFFAC	97.1953	137.6410	.2067	.7326
XMECHANI	96.0743	138.7623	.1572	.7376

α = .7349

TF Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
DISPEMOT	101.5486	145.6717	.4126	.6784
JUSTHARM	102.9443	150.1697	.1748	.6967
IMPEPERS	102.0770	155.5089	.0801	.7022
PRINPEOP	102.1980	151.0573	.1827	.6953
EVALNONJ	102.5282	148.8289	.2163	.6929
FACTCOMP	102.0076	144.7375	.3846	.6790
LOGHUMAN	102.7468	153.4927	.1368	.6984
SKEPTRUS	101.4642	142.9431	.4008	.6767
STRIFORG	101.3503	140.8071	.4680	.6708
XEMPALOG	102.6899	149.2720	.2483	.6900
XCARICOO	101.8634	145.2266	.2891	.6862
XOPENEVA	102.2386	148.2497	.2799	.6875
XRECEPSE	103.1680	153.9689	.1055	.7013
XSYMPFAI	103.4111	150.3476	.1914	.6948
XGULLSUS	103.1206	152.5651	.1277	.7003
XKINDANA	101.4869	143.2882	.4396	.6748
XFEELTHI	102.7569	143.0769	.3545	.6800
XTENDRAT	102.4021	144.6126	.3771	.6793
XACCEDIS	100.9367	149.5766	.2767	.6882
XLIGHPRU	102.6341	146.4042	.2883	.6864
AVOIDCON	102.8605	146.0696	.2008	.6967
EMOTIONL	101.9002	149.6681	.2510	.6899
SENSITIV	103.2255	152.6490	.1444	.6982
XBUSINES	103.3209	158.8378	-.0300	.7114

α = .6991

JP Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
RESPADAP	92.0272	183.6902	.2153	.6966
PROMFREE	90.3887	182.1097	.2401	.6947
TIMERELA	90.2769	180.3689	.2766	.6916
XFLEXORG	91.0794	176.3682	.3561	.6846
XRANDSEQ	90.7985	184.7927	.2576	.6939
XIMPUDEL	90.6614	191.6052	.0705	.7053
XIMPETAS	91.3654	184.6212	.2686	.6932
UNSCHEDU	90.4507	181.2415	.2047	.6985
LASTMINU	91.7979	178.0079	.2576	.6936
UNEXPECT	90.1001	181.8736	.2579	.6932
NOORGANI	90.8989	174.6398	.3372	.6857
GOWIFLOW	90.4720	186.9938	.1110	.7060
LASTMINT	91.1397	179.7137	.2567	.6934
FORMOMEN	89.9873	186.7396	.1706	.6997
ORDERIRR	92.1599	172.2450	.4658	.6753
XTHINKAH	91.9233	180.5325	.2935	.6904
XIMPULSI	91.2870	187.6224	.1482	.7012
XSTRUTIM	90.7647	181.8547	.2679	.6925
XENJLIST	90.5666	178.8088	.2993	.6896
XHATERUS	91.6763	185.5244	.1428	.7033
XROUCOMF	91.2159	180.0564	.3628	.6862
XLCLOSUR	91.1222	191.4408	.0648	.7061
XBEONTIM	92.4202	177.8203	.3658	.6847
XCOMMITM	91.6152	193.7216	-.0010	.7105
XPLANAHE	91.8164	175.9239	.4078	.6811

α = .7029

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Pre-service Teachers (n=49)

EI Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
SOCIPRIV	67.8739	424.1772	.7346	.9333
FRIEDIST	68.9147	439.6810	.6439	.9351
PERSOSHY	68.0857	425.9946	.7069	.9338
APPRMYST	68.7514	447.8420	.5151	.9369
MIXERLON	68.0576	424.9225	.8064	.9323
CONGRECL	68.3229	440.5562	.7261	.9344
EXUBSERE	67.5882	453.1353	.3588	.9393
GREGTIMI	67.9759	435.0745	.7147	.9341
XQUIEEXP	68.0780	427.6372	.7316	.9335
XREFLACT	67.5678	448.9510	.5012	.9371
XINTREXT	68.0167	417.3465	.7987	.9320
XSTILLAN	67.9963	436.0542	.6022	.9356
XSOLIAMI	68.1392	435.4678	.7019	.9342
XSILEGAB	67.7127	435.9981	.7024	.9342
SHYPERSO	67.0780	420.4589	.7060	.9338
PRESWRIT	67.7922	438.9127	.4881	.9378
XGRPPROJ	67.2820	428.2172	.5577	.9370
XRELAXSO	67.7106	418.1504	.6907	.9342
XLIKETAL	68.0371	442.0287	.4369	.9388
XNEWPEOP	68.4188	446.8875	.4143	.9387
XTALKOTH	68.2820	421.2289	.7734	.9326

α = .9381

SN Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
REALINTU	95.4082	329.4549	.2399	.8821
PRECIMAG	94.7006	306.5545	.6599	.8704
CONCEXPL	94.3537	311.9350	.5990	.8725
TRADCREA	94.7006	301.2629	.7362	.8679
DIRINGEN	95.2312	316.6189	.6048	.8732
PLANVISI	95.1292	320.3302	.4080	.8777
PRACTHEO	95.4761	337.1504	.0925	.8861
XINSISYS	94.7618	305.3589	.6481	.8705
XVARIREP	94.5373	311.3025	.5966	.8725
XINVENOR	95.6394	313.9924	.5613	.8735
XINQUCRI	95.1496	317.6923	.4670	.8760
XDIVERCO	94.9659	317.4573	.4368	.8769
XDIVEPRE	95.1700	316.8594	.4922	.8754
XCONCREA	95.4149	328.4215	.2967	.8803
DIFFPERS	93.8027	317.6271	.4077	.8779
USEINTUI	93.8435	324.6968	.3422	.8793
SEEPATTR	94.1904	323.5807	.3226	.8802
NEWSKILL	94.3333	330.7201	.1856	.8844
SEEMEANG	93.8843	317.8057	.5215	.8748
INVENTIV	94.5169	300.8453	.7107	.8684
CREATNEW	94.1292	300.6498	.7208	.8681
XPREFFAC	95.7414	327.5494	.2085	.8847
XMECHANI	94.8639	310.3909	.4921	.8753

α = .8809

TF Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
DISPEMOT	100.0612	164.9753	.3236	.7469
JUSTHARM	101.7143	155.4583	.4397	.7375
IMPEPERS	100.2653	165.6156	.3242	.7471
PRINPEOP	100.7755	172.5944	.0804	.7608
EVALNONJ	101.6939	164.6752	.2765	.7496
FACTCOMP	101.1633	153.8895	.5813	.7291
LOGHUMAN	100.9184	161.9515	.4562	.7401
SKEPTRUS	101.2653	166.6573	.2149	.7537
STRIFORG	101.0000	156.8750	.4154	.7395
XEMPALOG	101.5510	163.3776	.3696	.7442
XCARICOO	100.0204	165.8954	.3113	.7478
XOPENEVA	100.8367	162.2228	.3532	.7447
XRECEPSE	100.8980	175.5935	-.0221	.7695
XSYMPFAI	102.2041	164.6241	.3423	.7460
XGULLSUS	101.8776	168.8180	.1557	.7576
XKINDANA	101.4490	159.5026	.3850	.7421
XFEELTHI	101.4082	161.7049	.3883	.7427
XTENDRAT	101.6327	158.0706	.5255	.7347
XACCEDIS	100.5918	169.4966	.1714	.7556
XLIGHPRU	100.8980	159.6352	.4475	.7389
AVOIDCON	102.2245	178.2611	-.0910	.7771
EMOTIONL	100.6939	160.6752	.3570	.7441
SENSITIV	101.6531	164.6480	.2552	.7512
XBUSINES	101.8163	168.3197	.1793	.7558

α = .7565

JP Scale

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	α if Item Deleted
RESPADAP	79.3947	327.0189	.4828	.8588
PROMFREE	78.9865	326.9845	.4917	.8585
TIMERELA	79.3335	326.4195	.5797	.8563
XFLEXORG	79.3131	324.6200	.5300	.8573
XRANDSEQ	79.7214	335.1358	.4319	.8606
XIMPUDEL	78.9049	348.3787	.1733	.8672
XIMPETAS	79.8029	332.7291	.5683	.8577
UNSCHEDU	79.3467	328.4089	.4578	.8596
LASTMINU	79.7212	323.9136	.4609	.8596
UNEXPECT	79.0682	325.8149	.4685	.8592
NOORGANI	79.0273	317.7064	.5514	.8562
GOWIFLOW	79.4559	349.9754	.1501	.8675
LASTMINT	79.0273	326.0522	.4671	.8593
FORMOMEN	79.3131	330.5121	.4766	.8591
ORDERIRR	80.6600	329.0070	.5524	.8573
XTHINKAH	80.2927	337.6139	.3641	.8624
XIMPULSI	78.8845	327.0873	.5151	.8579
XSTRUTIM	78.8845	337.0773	.2992	.8648
XENJLIST	80.0886	332.3616	.3232	.8647
XHATERUS	79.7008	322.7974	.5965	.8554
XROUCOMF	79.9253	337.2802	.4929	.8597
XLCLOSUR	79.4763	344.9214	.2195	.8663
XBEONTIM	80.5988	339.7728	.3099	.8639
XCOMMITM	79.8845	345.6469	.1661	.8689
XPLANAHE	80.4151	334.8171	.4922	.8593

α = .8656

APPENDIX B
Correlation Matrix for Item Packets (n=328)

	EI1	EI2	EI3	SN1	SN2	SN3	TF1	TF2	TF3	JP1	JP2	JP3
EI1	1.0000000											
EI2	.6772200	1.0000000										
EI3	.7317590	.6551440	1.0000000									
SN1	-.1323760	-.0481395	-.0956204	1.0000000								
SN2	-.2123830	-.1216350	-.1945990	.4416480	1.0000000							
SN3	-.2258260	-.1872580	-.1905310	.4915880	.4854140	1.0000000						
TF1	-.2021270	-.3273390	-.1878170	.0395230	.0216895	.1239010	1.0000000					
TF2	-.2251590	-.2927780	-.2154860	.1466550	.0989655	.2180760	.4952360	1.0000000				
TF3	.0572427	-.1258220	-.0132158	-.0216677	-.0367474	.0615902	.5006030	.3946910	1.0000000			
JP1	.0068987	-.0172261	.0191119	.2250460	.0819026	.2769210	.0138105	.0795998	-.0105934	1.0000000		
JP2	-.0893446	.0141765	-.0493287	.2418770	.1019860	.3353330	-.0247871	.1363720	-.0644517	.4691680	1.0000000	
JP3	-.0817344	-.0112236	-.0554822	.2236940	.0317186	.1870450	-.0685574	.0732254	-.0220091	.4932900	.4206800	1.0000000

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